end of the central shaft has a large first diameter **94** as shown in FIG. **7** which steps to a smaller second diameter **96** which subsequently steps down to a smaller yet third diameter bore **98**. A locking coil **100** is disposed against the first largest diameter bore **94** in the central shaft. The main coil **50** has an outer diameter slightly larger than the inner diameter of the locking coil **100** and is threadedly received therethrough. The main coil **50** thus extends to and abuts the handle **17** adjacent the second stepped bore **96** of the bore **92** in the central shaft. The pull wires **60** disposed through the inner lumen of the main coil extend therethrough and into the smallest portion **98** of the bore **92** in the central shaft. A strain relief sheath **102** is disposed distally to the locking coil about the main coil **50** within the largest bore **94** in the central shaft. The strain relief sheath **102** extends slightly distally of the distalmost end of the central shaft, and is bonded to the inner walls of the largest bore **94** by a solvent which is directed thereto through a hole **104**, as shown in FIG. **7**. The strain relief sheath **102** limits twist and movement of the main coil **50** with the bore **94** while preventing a sharp bend of the coil **50** at the distal end of the handle **17**. The proximalmost end of the pull wires **60** extend through the proximal end of the main coil **50** as aforementioned and through and anti-kinking tube **109**, and are locked into a cross pin **110**, as shown in FIG. **1**, which cross pin **110** mates with a slot **112** disposed across the central shaft of the handle **17**. The slot **112** is in communication with the axial bore **92** in the central shaft. The proximalmost end of the pull wires **60** are locked into the cross pin **110** by a set screw **114** as shown in FIG. **1**. The ends of the cross pins **110** mate with a slot **116** in the spool so as to lock the cross pin **110** therewith. Movement of the spool **19** which is disposed about the central shaft thereby effectuates movement of the puller wires **60** disposed within the main coil **50**, the distal ends of which are attached to the tangs **24** on the cutter jaws **18** as shown in FIGS. **1** and **2**.

Thus there has been shown a biopsy forceps assembly which can be made in a very cost effective manner for an improved biopsy sample. The cutter jaws and clevis support of the biopsy forceps each being made of a cast material permitting a far less expensive manufacture because of its simplicity permitting one jaw design and its self-aligning radially directed distal jaw teeth effectuating its cutting effectiveness as well as its ease of assembly. The pull wire arrangement with each particular jaw eliminates the prior art multiple linkages which have frictional problems and potential for breakage therewith. The spool design for the grasping of the pull wires in regard to the handle therewithin facilitates a one-handed operation thus permitting the physician use of his other hand for other purposes.

We claim:

**1**. A biopsy forceps device having a proximal end and a distal end, the device comprising:

an end effector assembly at the distal end of the device, wherein the end effector assembly includes a first jaw and a second jaw, the first jaw being pivotally disposed about a pivotal axis and with respect to the second jaw;

an actuator at the proximal end of the device; and

a hollow portion connecting the end effector assembly and the actuator, wherein the actuator operates to pivot the first jaw about the pivotal axis and move the first jaw into contact with the second jaw, wherein each of the first and second jaws includes a generally U-shaped configuration defining a center point and having a distalmost end, and wherein an edge of the distalmost end of each of the jaws includes teeth radially disposed about the center point.

**2**. The device according to claim **1**, wherein the second jaw is pivotally disposed about the pivotal axis and with respect to the first jaw so that the jaws mate upon pivotal movement.

**3**. The device according to claim **2**, further comprising a clevis pin, wherein the pivotal axis is defined by the clevis pin.

**4**. The device according to claim **1**, wherein the teeth have a substantially triangular shape.

**5**. The device according to claim **4**, wherein the teeth of the first and second jaws mate.

**6**. The device according to claim **5**, wherein the teeth of the first jaw are displaced by one half pitch from the teeth of the second jaw.

**7**. The device according to claim **1**, wherein the first and second jaws have a generally elongated hemispherical shape.

**8**. The device according to claim **1**, wherein the first jaw has a tang defining a first bore.

**9**. The device according to claim **8**, further comprising a first pull wire positioned within the hollow portion, the first pull wire connecting the first jaw to the actuator and engaging the first bore, wherein a distal end of the first pull wire passes through and beyond the first bore and terminates without forming a loop.

**10**. The device according to claim **9**, further comprising a second pull wire positioned within the hollow portion and connecting the second jaw to the actuator.

**11**. The device according to claim **10**, wherein the second jaw has a tang defining a second bore and the second pull wire engages the second bore, a distal end of the second pull wire passing through and beyond the second bore and terminating without forming a loop, the actuator operating to pivot the second jaw about the pivotal axis.

**12**. The device according to claim **11**, wherein the distal end of the second pull wire includes a main portion which extends in the direction of the actuator, a first portion which passes through the second bore at an angle to the main portion, and a second portion on the opposite side of the second bore relative to the main portion, the second portion of the second pull wire maintaining the second pull wire on the tang, the second pull wire terminating on the second portion.

**13**. The device according to claim **10**, wherein the actuator includes a handle being coupled to the first and second pull wires.

**14**. The device according to claim **13**, wherein the handle includes a central shaft and a spool slidably disposed around the central shaft, the spool engaging the first and second pull wires, the spool operable to move the first and second pull wires relative to the central shaft.

**15**. The device according to claim **10**, wherein the first and second pull wires are positioned within the hollow portion for a substantial length of the hollow portion.

**16**. The device according to claim **9**, wherein the distal end of the first pull wire includes a main portion which extends in the direction of the actuator, a first portion which passes through the first bore at an angle to the main portion, and a second portion on the opposite side of the first bore relative to the main portion, the second portion of the first pull wire maintaining the first pull wire on the tang, the first pull wire terminating on the second portion.

**17**. The device according to claim **16**, wherein the first pull wire is bent between the main portion and the first portion and between the first portion and the second portion.

**18**. The device according to claim **17**, wherein the first portion of the first pull wire which passes through the bore is rotatable relative to the surface of the bore.

19. The device according to claim 1, wherein the hollow portion is a coil.

20. The device according to claim 1, further comprising a needle disposed between the first and second jaws.

21. An end effector assembly for use in a biopsy forceps device including an actuator at a proximal end of the device and a hollow portion connecting the actuator to the end effector assembly, the end effector assembly comprising:

a first jaw; and

a second jaw for mating with the first jaw, wherein the first jaw is pivotally disposed with respect to the second jaw about a pivotal axis, and each of the first and second jaws includes a generally U-shaped configuration defining a center point and having a distalmost end, and wherein an edge of the distalmost end of each of the jaws includes teeth radially disposed about the center point.

22. The assembly according to claim 21, wherein the second jaw is pivotally disposed about the pivotal axis and with respect to the first jaw so that the jaws mate upon pivotal movement.

23. The assembly according to claim 22, further comprising a clevis pin, wherein the pivotal axis is defined by the clevis pin.

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24. The device according to claim 22, wherein the second pull wire is bent between the main portion and the first portion and between the first portion and the second portion.

25. The device according to claim 24, wherein the first portion of the second pull wire which passes through the second bore is rotatable relative to surface of the bore.

26. The assembly according to claim 21, wherein the teeth have a substantially triangular shape.

27. The assembly according to claim 26, wherein the teeth of the first and second jaws mate.

28. The assembly according to claim 27, wherein the teeth of the first jaw are displaced by one half pitch from the teeth of the second jaw.

29. The assembly according to claim 21, wherein the first and second jaws have a generally elongated hemispherical shape.

30. The assembly according to claim 21, wherein the first jaw has a tang defining a first bore for receiving a first pull wire.

31. The assembly according to claim 21, wherein the second jaw has a tang defining a second first bore for receiving a second pull wire.

32. The assembly according to claim 21, further comprising a needle disposed between the first and second jaws.

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